

## Quarterly Activity and Monitoring Report

April 1 – June 30, 2009

*In compliance with the "Management Agency Agreement between the  
Central Valley Regional Water Quality Control Board and the United States  
Bureau of Reclamation" executed on December 22, 2008*

August 12, 2009

## Abbreviations and Acronyms

Action Plan	Actions to Address the Salinity and Boron TMDL Issues for the Lower San Joaquin River
AF	acre-foot or acre-feet
Authority	San Luis & Delta-Mendota Water Authority
Basin Plan	Water Quality Control Plan for the Sacramento and San Joaquin River Basins, 4 <sup>th</sup> Edition
BMP	Best Management Practices
CALFED	CALFED Bay-Delta Program
CDEC	California Data Exchange Center
CDFG	California Department of Fish and Game
cfs	cubic feet per second
Corps	U.S. Army Corps of Engineers
CVO	Central Valley Operations
CVP	Central Valley Project
CVPIA	Central Valley Project Improvement Act
CVRWQCB	Central Valley Regional Water Quality Control Board
CV-SALTS	Central Valley Salinity Alternatives for Long Term Sustainability
DCRT	Data Collection and Review Team
DMC	Delta-Mendota Canal
DWR	California Department of Water Resources
EC	electrical conductivity
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
Exchange Contractors	San Joaquin River Exchange Contractors Water Authority
GBP	Grassland Bypass Project
GDA	Grassland Drainage Area
GRCD	Grassland Resource Conservation District
GUI	graphical user interface
ID	irrigation district
Interior	U.S. Department of the Interior
IPO	Interim Plan of Operations
MAA	Management Agency Agreement
μS/cm	micro Siemens per centimeter
μg/L	microgram(s) per liter
mg/L	milligram(s) per liter

Quarterly Activity Report: *April 1 – June 30, 2009*

NPDES	National Pollutant Discharge Elimination System
QA	Quality Assurance
QAPP	Quality Assurance Project Plan
QC	Quality Control
Reclamation	Bureau of Reclamation
RTMP	Real Time Management Program
Secretary	Secretary of the Interior
Service	U.S. Fish and Wildlife Service
SJR	San Joaquin River
SJRIP	San Joaquin River Improvement Project
SJRWQMG	San Joaquin River Water Quality Management Group
SLDMWA	San Luis and Delta Mendota Water Authority
SWP	State Water Project
SWRCB	State Water Resources Control Board
TAF	thousand acre-feet
TDS	total dissolved solids
TMDL	total maximum daily load
TPRT	Technical Policy and Review Team
VAMP	Vernalis Adaptive Management Plan
WAP	Water Acquisition Program
WCFSP	Water Conservation Field Service Program
WDR	Waste Discharge Requirement
WQO	water quality objective
WRDP	Westside Regional Drainage Plan
YSI	Yellow Spring Instrument

### Purpose

The Central Valley Regional Water Quality Control Board's Salt and Boron Total Maximum Daily Load (TMDL) was approved and placed into effect on July 28, 2006. In response to the Salinity and Boron TMDL, the United States Bureau of Reclamation (Reclamation) developed a salinity control plan, *Actions to Address the Salinity and Boron TMDL Issues for the Lower San Joaquin River* (Action Plan) and entered into a Management Agency Agreement (MAA) with the Central Valley Regional Water Quality Control Board on December 22, 2009. The MAA describes the actions Reclamation will take to meet the obligations allocated to it by the Salinity and Boron TMDL for the lower San Joaquin River. The MAA states:

Reclamation will submit quarterly reports to the Regional Water Board by 45 days after the end of the calendar quarter. The quarterly reports will include a summary of activities conducted by Reclamation during the quarter in conjunction with each element included in their Action Plan, including activities related to developing a Real Time Management Program. In addition Reclamation will include data collected relevant to DMC load evaluation.

The "Quarterly Activity and Monitoring Report" summarizes the activities conducted by Reclamation in conjunction with each element outlined in its salinity control plan for the lower San Joaquin River. The Action Plan describes Reclamation's past, current and planned practices and procedures to mitigate and manage adverse impacts of salt and boron imported into the San Joaquin basin via the Delta Mendota Canal (DMC) in order to help achieve compliance with the objectives contained in the Regional Water Board's *Water Quality Control Plan for the Sacramento River and the San Joaquin River Basins – 4<sup>th</sup> Edition* (Basin Plan).

### Organization of Quarterly Report

The quarterly report will provide a synopsis of the various activities associated with each element identified in the Action Plan. The Action Plan describes all of the actions contemplated by the MAA. Within the Action Plan, actions are divided into three major categories: Flow, Salt Load Reduction, and Mitigation. For each action a brief description and list of activities are identified. The quarterly report will include calculations of salt loads based on DMC deliveries and calculations of assimilative capacity provide through dilution flows. The calculation methods used in this report are provisional and some elements in this report (such as the Westside Regional Drainage Plan) do not include estimations of benefits at this time. Reclamation is in the process of developing the *Compliance Monitoring and Evaluation Plan* which will outline the criteria and methodology for determining DMC loads and credits.

### A. Flow Actions

Reclamation has agreed to provide mitigation and dilution flows to meet the Vernalis salinity and boron objectives. Historically, Reclamation has provided dilution flows from the New Melones Project and through purchases for the Vernalis Adaptive Management Plan. Flow actions include: dilution flows from New Melones and water acquisitions.

#### 1. New Melones flows

Brief Description: In the Flood Control Act of October, 1962, the Congress reauthorized and expanded the New Melones project (P.L. 87-874) to a multipurpose unit to be built by the U.S. Army Corps of Engineers (Corps) and operated by the Secretary of Interior as part of the Central

Valley Project (CVP), thus creating the New Melones Unit. The multipurpose objectives of the unit include flood control, irrigation, municipal and industrial water supply, power generation, fishery enhancement, water quality improvement, and recreation. New Melones Reservoir is currently operating under an "Interim Operating Agreement." This agreement was completed in 1996 with significant input from stakeholder interests.

Activity:

- *Developing a methodology to accurately depict the assimilative capacity resulting from New Melones operations.*

Quantification Methodology: The Basin Plan Amendment specifies that entities providing dilution flows obtain an allocation equal to the salt load assimilative capacity provided by this flow. For the quantification of dilution flow allocations, the Basin Plan Amendment uses the following equation to calculate assimilative capacity. However, this equation only applies if the dilution flow being quantified provides true dilution all the way to Vernalis on the San Joaquin River. In other words, dilution flows are those flows that enter the San Joaquin River and create assimilative capacity without interfering with the origin (Stanislaus River) subarea's ability to comply with its salinity load allocation under the Basin Plan. To calculate the assimilative capacity created by Reclamation operations on the Stanislaus River, both the actual load in the river and the load allocation for the river are calculated. The actual load is subtracted from the allocation to determine if assimilative capacity is available. Calculation of the actual load on a monthly basis is based on Appendix A<sup>1</sup> to the Basin Plan Amendment, which uses a site-specific EC to TDS ratio:

$$L_{\text{actual}} = Q_{\text{actual}} * C_{\text{actual}} * 0.69 * 0.0013599$$

Where:

- $L_{\text{actual}}$  = actual load in tons of salt per month
- $Q_{\text{actual}}$  = actual monthly flow volume in acre-feet (AF)
- $C_{\text{actual}}$  = average monthly electrical conductivity in  $\mu\text{S}/\text{cm}$
- 0.69 = TDS:EC ratio specific to Stanislaus River (Appendix A to Basin Plan Amendment)
- 0.0013599 = Salinity unit conversion, to convert Total Dissolved Solids (TDS) to tons

The load allocated to the Stanislaus River subarea is a summation of its Load Allocation and its Consumptive Use Allowance. The Load Allocation is prescribed in Table 4-15 of Appendix 1 to the Technical TMDL Report for Salt and Boron in the Lower San Joaquin River (September 2003). The Consumptive Use Allowance is the product of the actual monthly flow volume and a trigger salinity value of 192 mg/L TDS. Table 1 illustrates the available assimilative capacity from the Stanislaus Subarea resulting from New Melones operations.

---

<sup>1</sup> Appendix A to the Technical TMDL Report for Salt and Boron in the Lower San Joaquin River (September 2003).

**Table 1. Assimilative Capacity from Stanislaus Subarea, tons**

	Flow at RIP, AF <sup>2</sup>	EC at RPN, $\mu\text{S}/\text{cm}$ <sup>3</sup>	Subarea Base Load Allocation, tons (TMDL Table 4-15, dry year) <sup>4</sup>		Subarea Allocation, tons	Actual Subarea Load, tons	Assimilative Capacity provided by Subarea, tons
April to August Standard, 700 $\mu\text{S}/\text{cm}$							
beg Apr	7297.0	80.0	228		2,133	548	1,585
VAMP	28555.0	66.9	1,169		8,625	1,792	6,833
end May	13260.0	68.6	29		3,491	854	2,638
Jun	18969.0	70.9	0		4,953	1,262	3,691
Qtr Total	68081.0		1426		19,202	4,455	14,747

## 2. Water Acquisitions

Brief Description: The Central Valley Project Improvement Act (CVPIA) signed into law on October 30, 1992, modified priorities for managing water resources of the Central Valley Project. CVPIA altered the management of the Central Valley Project to make fish and wildlife protection, restoration, and enhancement as project purposes having equal priority with agriculture, municipal and industrial, and power uses. To meet water acquisition needs under CVPIA, the U.S. Department of the Interior (Interior) has developed a Water Acquisition Program (WAP), a joint effort by the Reclamation and the U.S. Fish and Wildlife Service (Service). The program's purpose is to acquire water supplies to meet the habitat restoration and enhancement goals of the CVPIA and to improve the Interior's ability to meet regulatory water quality requirements.

### Activity:

- *Developing a methodology to accurately depict the assimilative capacity resulting from Water Acquisition Purchases.*

<sup>2</sup> Flow data obtained from California date Exchange Center (CDEC); Ripon (RIP) monitoring station

<sup>3</sup> Water quality data obtained from California date Exchange Center (CDEC); Ripon (RPN) monitoring station.

<sup>4</sup> Table 4-15 of Appendix 1 to the Technical TMDL Report for Salt and Boron in the Lower San Joaquin River (September 2003).

- *As defined by the conditions of the VAMP agreement, 2009 was classified as an off-ramp year. Reclamation did not acquire any VAMP flows this quarter that provided assimilative capacity to the river.*

Quantification Methodology: The Basin Plan Amendment specifies that entities providing dilution flows obtain an allocation equal to the salt load assimilative capacity provided by this flow, calculated as follows:

$$A_{dil} = Q_{dil} * (C_{dil} - WQO) * EC:TDS * 0.0013599$$

Where:

$A_{dil}$	=	dilution flow allocation in tons of salt per month
$Q_{dil}$	=	dilution flow volume in acre-feet per month
$C_{dil}$	=	dilution flow electrical conductivity in $\mu S/cm$
WQO	=	salinity water quality objective for the LSJR at Airport Way Bridge near Vernalis in $\mu S/cm$
EC:TDS	=	TDS:EC ratio specific to River (Table A- 3 in Appendix A to Basin Plan Amendment) or 0.66 for the Merced River and 0.67 for the Tuolumne River
0.0013599	=	Salinity unit conversion, to convert TDS to tons

As discussed in the previous section, Reclamation also examined the time periods when dilution flows through the WAP purchases occur to determine that these dilution flows are actually providing assimilative capacity to the San Joaquin River, and not merely providing assimilative capacity that is used by their subarea of origin. Allocations were determined for the subareas where dilution flows originated, based on the actual flows measured closest to tributary confluences with the main stem of the river and the base load allocations specified in Table 4-15 of Appendix 1 to the Technical TMDL Report for Salt and Boron in the Lower San Joaquin River (September 2003).

Subarea salt load allocation calculations are based on the Base Load Allocations and the Consumptive Use Allowance calculations for the Merced River and Tuolumne River subareas. Flow data was obtained from USGS stream gauging stations at Modesto for the Tuolumne River (11290000) and near Stevinson for the Merced River (11272500). Occasionally Merced River data is supplemented by the Department of Water Resources station near Stevinson (B05125, MST). Salinity data from the Merced River at Stevinson (MST) and the Tuolumne River at Modesto (MOD) is used, where hourly EC data is available on CDEC from monitoring stations maintained by the California Department of Water Resources. Table 2 illustrates the available assimilative capacity from the Merced and Tuolumne Subarea resulting from the water acquisition purchases.

**Table 2. Assimilative Capacity from Water Acquisition Program flows, tons**

	Merced River		Tuolumne River	
	VAMP	October	VAMP	October
WAP Volume, TAF	0	-	0	-
Salinity (EC), mS/cm	-	-	-	-
Dilution Capacity, tons	0	-	0	-
Base Allocation, tons <sup>5</sup> (dry year)	2112	-	1210	-
Subarea Flow, TAF <sup>6</sup>	8.8	-	23.0	-
Consumptive Use Allowance, tons	2,291	-	5,993	-
Subarea Allocation, tons	4,403	-	7,203	-
Subarea Flow, TAF	8.8	-	23.0	-
Salinity (EC), $\mu$ S/cm <sup>7</sup>	136	-	75	-
Actual Subarea Load, tons	1,118	-	1,623	-
Assimilative Capacity from Subarea, tons	3,285		5,581	
Assimilative Capacity from WAP, tons	0	0	0	0

### **B. Salt Load Reduction Actions**

Reclamation is under a court order to provide drainage to its San Luis Unit, on the Westside of the lower San Joaquin River. As part of its efforts to provide drainage, Reclamation has historically supported the Westside Regional Drainage Plan (WRDP) through monetary grants and in-kind services. Reclamation recognizes there is still much to be done to implement the Westside Regional Drainage Plan. Salt Load Reduction Actions include the Grasslands Bypass Project, the Westside Regional Drainage Plan, and conservation programs (Water Conservation Field Services Program, Water 2025 Grants Program, and the CALFED Water Use Efficiency Program).

#### **1. Grassland Bypass Project**

**Brief Description:** The Grassland Bypass Project is a multi-agency stakeholder project based upon an agreement between the Reclamation and the Authority to use a 28-mile segment of the San Luis Drain to convey agricultural subsurface drainage water from the Grassland Discharge

<sup>5</sup> Table 4-15 of Appendix 1 to the Technical TMDL Report for Salt and Boron in the Lower San Joaquin River (September 2003).

<sup>6</sup> Flow data obtained from California data Exchange Center (CDEC); Merced River at Stevinson (MST) and the Tuolumne River at Modesto (MOD)

<sup>7</sup> Water Quality data obtained from California data Exchange Center (CDEC); Merced River at Stevinson (MST) and the Tuolumne River at Modesto (MOD)



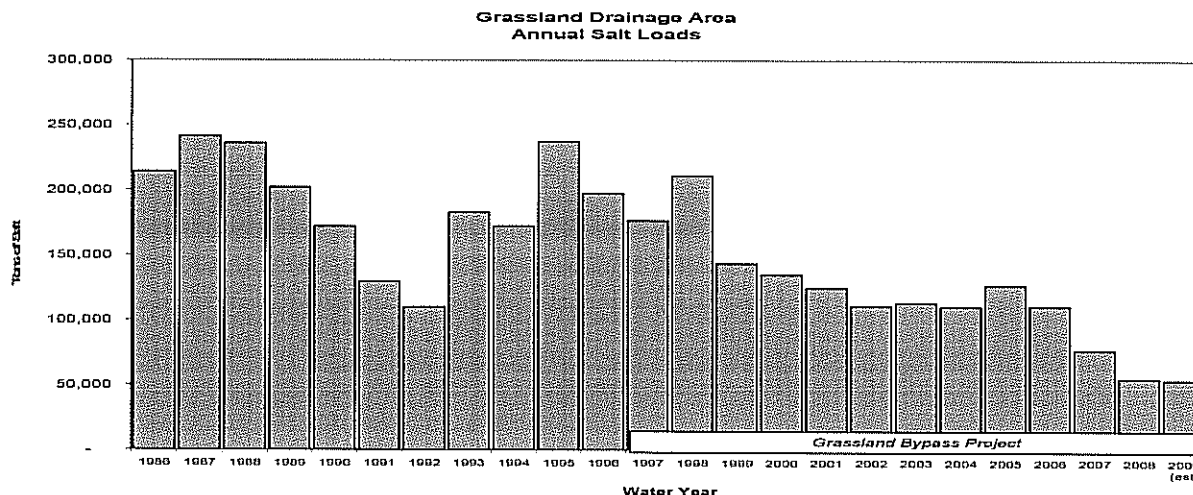
Area (GDA) to Mud Slough, a tributary of the San Joaquin River. The purpose of the project is to separate unusable agricultural drainage water discharged from the GDA from wetland water supply conveyance channels, facilitate drainage management that maintains the viability of agriculture in the GDA, and promote continuous improvement in water quality in the San Joaquin River.

Activity:

- *Reclamation continues to administer the 2001 Agreement to Use the San Luis Drain and meet the terms of the 2001 Waste Discharge Requirements. The agreement will end December 31, 2010.*
- *In Water Year 2009, the third year of drought reduced the acres of irrigated field crops in the GDA. Consequently, the volume of unusable subsurface drainage water discharged from the GDA to Mud Slough (north) was significantly reduced. The annual load of salts discharged in 2009 are estimated to be about 54,000 tons, the lowest in 23 years and half of the load discharged in drought year 1991.*
- *Reclamation is negotiating a third use agreement to continue the Project through 2019, allowing more time to obtain funds to construct treatment facilities that will completely eliminate all discharges of unusable agricultural subsurface drainage water from the GDA to the San Joaquin River and local wetland water supply channels.*
- *Reclamation has completed important documentation to support the new Use Agreement, including an Administrative Draft EIS/EIR, prepared by Entrix Inc. Written comments were received from 14 agencies for Appendix 1.*
- *The EIS/EIR for the continuation of the Grassland Bypass Project was completed and sent to the EPA. A notice of availability will be published in the Federal Register soon. The San Luis and Delta-Mendota Water Authority has certified that the document complies with CEQA and the Regional Board will use the document to proceed with the amendment to the Basin Plan. The NEPA portion will be completed with the receipt of a Biological Opinion from the US Fish and Wildlife Service.*

Figure 1 graphically depicts the annual reduction of salt load to the basin from the Grassland Drainage Area.

Figure1



## 2. Westside Regional Drainage Plan (WRDP)

**Brief Description:** The Westside Regional Drainage Plan is a local stakeholder program developed by integrating all consistent elements of drainage management developed by government and local agencies and private partnerships. The original efforts of the WRDP focused on reducing selenium discharges to the San Joaquin River. Success of the original effort prompted a proposal to expand the WRDP to go beyond regulatory requirements and eliminate selenium, boron, and salt discharges to the San Joaquin River, while maintaining productivity of agriculture lands in the solution area and enhancing water supplies for the region.

While Reclamation lacks control of many of the resources needed to be an active participant in the WRDP, Reclamation provides annual funding to support and sustain the WRDP.

### **Activity:**

- *Reclamation is completing a grant for \$6.385 million dollars to support development of the WRDP. We expect this grant to be executed by mid-August 2009. The grant, combined with state Proposition 50 funding and local cost sharing, will be used to develop more than 6,000 acres of reuse lands. This reuse area has been an important tool to ensure the success of the Grassland Bypass Project.*
- *Funds will be used to install facilities to collect and distribute drain water across the reuse area, remove and replace open drain ditches that were hazardous to waterfowl, and line earth canals with concrete to reduce seepage losses.*
- *Funds will also be used to line water supply canals in three districts in the GDA to reduce seepage losses to the shallow aquifer, and to plumb six sumps that currently discharge highly saline groundwater into the DMC.*

## 3. Conservation Efforts

**Brief Description:** The water use efficiency program element includes several grant programs which fund actions to assure efficient use of existing and any new water supplies. Efficiency actions can alter the pattern of water diversions and reduce the magnitude of diversions, providing additional benefits. Efficiency actions can also result in reduced discharge of effluent or drainage and improved water quality. Although Reclamation is unable to quantify the benefits of the various funded projects as related to salinity reduction, the following information is provided to depict the agency's water conservation efforts in the basin. Through Water 2025, CALFED, and the WCFSP, Reclamation has awarded 40 projects in the San Joaquin Valley that require performance measures since 2006. As information is collected from these projects quantifiable benefits may be determined in the future.

### **Activity:**

- *Reclamation recently concluded the solicitation process for the Water for America Initiative Challenge Grants and the CALFED Water Use Efficiency Grant Program. These grants are in the final approval process and the anticipated award dates are July of 2009.*

*Under the 2009 WCFSP, three proposals from water districts within the San Joaquin Basin have been awarded. These projects involved flow control structures, SCADA, and metering. Fresno ID received a \$25,000 grant to install automatic canal gates and equipment for flow rate monitoring on the Washington Colony Canal. The total project cost is \$187,000. James ID received a \$25,000 grant to install a flow control structure. The total project cost is \$57,300. Madera ID received a \$50,000 grant to replace inefficient meters throughout the District. The total project cost is \$100,000.*

*The Water for America Initiative has identified nine Challenge Grant projects in the San Joaquin Valley. If all these projects are selected they would total approximately \$3,000,000. Additional information will be provided post award.*

- *Under the 2009 CALFED Water Use Efficiency Grant Program, one proposal from a water district within the San Joaquin Basin is under review for grant consideration. This project is for canal improvements. If awarded, this grant would provide the district with \$554,665 towards their \$1,109,330 project. Additional information will be provided post award (awards will be made in August of 2009).*
- *Under the American Recovery and Reinvestment Act (ARRA), Reclamation is soliciting an additional \$40 million in Challenge Grants for water use efficiency projects. These grants are competed Reclamation-wide with the solicitation period closing on May 22, 2009. Proposals will be reviewed by a technical expert panel and awards will be made based on merit. The program has a 50% applicant cost-share requirement and awards will range from \$1,000,000 to \$5,000,000. Additional information will be provided post award identifying activities in the San Joaquin Basin (awards will be made in August of 2009).*

### **C. Mitigation Actions**

Reclamation's Action Plan identifies two mitigation actions to reduce salinity loads: a real time management program to maximize the removal of salt using assimilative capacity in the San Joaquin River, and a wetlands BMP plan to research and potentially develop practices to reduce salinity loading from managed wetlands. Reclamation has actively supported the development of a real time monitoring and forecasting program in the River and in managed wetlands.

#### **1. Real Time Management Program – Development of Stakeholder-Driven Program**

Brief Description: The Real Time Management Program is described in the TMDL as a stakeholder driven effort to use “real-time” water quality and flow monitoring data to support water management operations in order to maximize the use of assimilative capacity in the San Joaquin River. The Regional Board describes this assimilative capacity as up to 85% of the load determined by Vernalis salinity objective. Reclamation has contracted with a facilitation firm to support the development of a stakeholder-driven program.

#### **Activity:**

- *Reclamation continues working with its consultants to facilitate stakeholder involvement in developing a Real Time Management Program (RTMP).*

- *Reclamation and its partnering agencies are preparing for the second stakeholder workshop to be held on August 12, 2009 at the Robert J. Cabral Agricultural Center in Stockton, CA.*
- *Reclamation submitted a contract proposal for additional technical support of the Real Time Management Program for FY 2010.*
- *Reclamation's contractor CDM initiated efforts to develop a salt source map and white paper for the project area.*

## 2. Real Time Management Program – Technical Support

Brief Description: A successful RTMP will require a real time monitoring network and a model capable of reasonably accurate forecasting of assimilative capacity. Reclamation is committed to participate in the development and support of these tools. Reclamation staff has valuable experience in both of these areas. The technical support of this program will follow the stakeholder process.

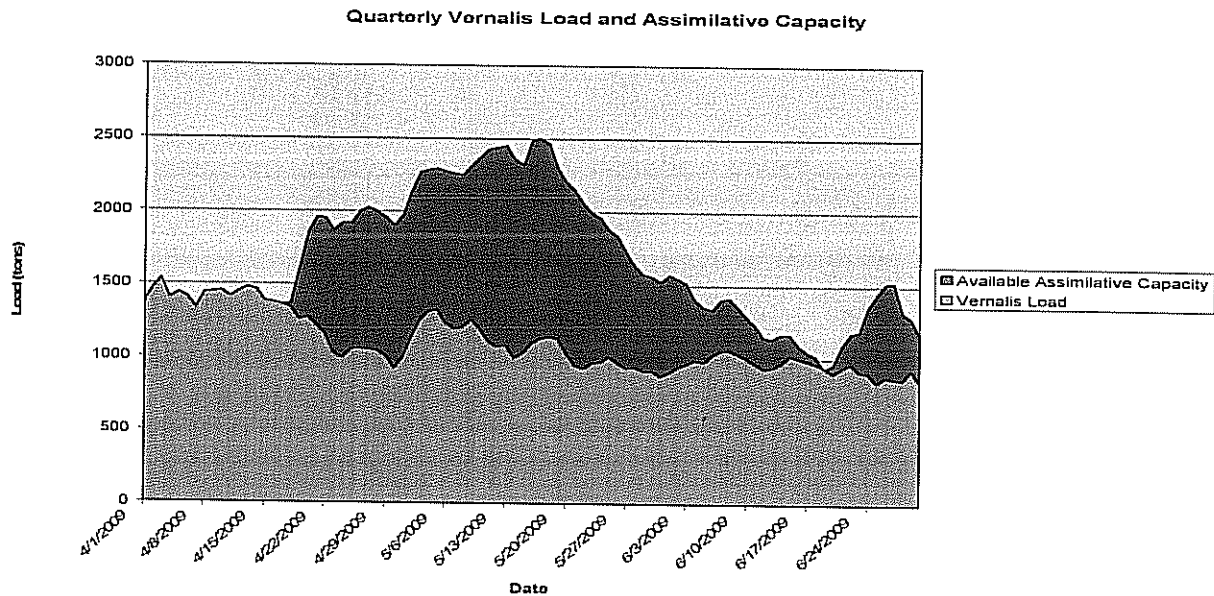
### Activity:

- *Reclamation is working with its consultant to develop a graphical user interface (GUI) and water quality data management tool. This work is complete and will be presented at the second stakeholder workshop in August 2009.*
- *Reclamation has developed a database model that is gaining acceptance across the region. A demonstration of this model will be presented to stakeholders at the second stakeholder workshop in August 2009.*
- *Routine conference calls are taking place among the various work groups. Discussions during these meetings intersect many other programs (Upstream TMDL, CV SALTS, South Delta Salinity and Flow, ILRP, SJR Restoration, etc.) and there is a need for great coordination amongst agency members and stakeholders.*
- *Reclamation executed a cooperative agreement with Berkeley National Laboratory to oversee the development and analysis of various salinity scenarios through the WARMF model. Work will be presented at the second stakeholder workshop in August 2009.*

The concept behind the RTMP is to enable the use of available assimilative capacity to export salt loads from the basin or to better time the release of salinity loads into the river to times when there is greater dilution capacity, which should also reduce the times where river capacity is exceeded (to the extent that exceedances are caused by discharges and not by background or allowed loads). Development of an accurate forecast model will serve as a decision making tool to help manage salinity loads in the river without violating water quality standards.

Figure 2 illustrates the timing and magnitude of potential dilution capacity in tons for the time period from April 1 – June 30, 2009, by calculating actual salinity loads at Vernalis and the Basin Plan load goals of meeting 85 percent of the Water Quality Objective. Table 3 illustrates assimilative capacity at Vernalis (allowed loads based on existing WQO and a margin of safety minus actual loads) in monthly loads.

Figure 2



**Table 3. Monthly “Real-Time” Assimilative Capacity at Vernalis, tons**

	Vernalis Flow, TAF	Vernalis EC, µS/cm	Vernalis actual load, tons	Vernalis max load, tons	Assimilative Capacity, tons
April to August Standard, 700 µS/cm					
beg Apr	34.1	719	20,344	16,828	-3,516
VAMP	127.3	355	37,531	62,830	25,299
end May	64.5	302	16,172	31,849	15,677
Jun	77.4	454	29,137	38,208	9,071

### 3. Wetlands BMP Plan

**Brief Description:** The Service, CDFG, and the Grassland Resource Conservation District (GRCD) in coordination with Reclamation are developing BMP plans to reduce the impact of discharges from managed wetlands into the San Joaquin River. Currently, the developed draft BMP plan is awaiting the Service’s approval.

Activity:

- *Reclamation is sponsoring a project entitled “Water Quality Monitoring in the Grassland Resource Conservation District”. This 3-year project will retrofit 6 existing monitoring stations and integrate these stations with existing stations as part of a SWRCB-sponsored pilot project on wetland real-time salinity management. The project will install 28 additional stations in the Grassland Water District, California Department of Fish and Game, and US Fish and Wildlife Service lands. All stations will become part of a sensor network that is currently supported by YSI EcoNet. Research supported by Reclamation as part of this project will investigate data management systems and develop software that will integrate existing sensor networks into a common decision support system. The decision support system will ultimately be used to help schedule wetland salt loading to the San Joaquin River.*
- *Reclamation has executed a cooperative agreement with Berkeley National Laboratory to oversee the development of the pilot real-time water quality management program and the decision support system described above. This program will continue some of the research work initiated under the SWRCB-sponsored grant which will address the feasibility and long term impacts of delayed seasonal wetland drawdown.*
- *Reclamation is working with the Service, CDFG, and local wetlands managers to finalizing the BMP Plan.*
- *Reclamation submitted a contract to purchase additional monitoring equipment to develop a real time monitoring network on managed wetlands.*
- *Reclamation is sponsoring several groundwater conjunctive use investigations in the western San Joaquin Basin that have direct relevance to salinity management. The first project will drill and complete two production wells in the Volta Wildlife Management Area to supplement current wetland water supply. These wells will be continuously monitored for electrical conductivity and drawdown to assess long term impacts on refuge water quality and local groundwater resources. The second is investigating land subsidence impacts of groundwater conjunctive use in the Grasslands Basin. Substitution of groundwater supply for surface water can increase drainage salt load exports from the Basin – however increased pumping increases the risk of land subsidence which can damage existing surface water conveyance facilities. Groundwater management will be part of any long term real-time water quality management strategy.*

#### 4. Involvement in CV-SALTS program

Brief Description: The Central Valley Water Board and State Water Board initiated a comprehensive effort to address salinity problems in California’s Central Valley and adopt long-term solutions that will lead to enhanced water quality and economic sustainability. The Central Valley Salinity Alternatives for Long-Term Sustainability (CV-SALTS) is a collaborative basin planning effort aimed at developing and implementing a comprehensive salinity management program. The goal of CV-SALTS is to maintain a healthy environment and a good quality of life for all Californians by protecting the state’s most essential and vulnerable resource: water.

Activity:

- *Reclamation continues to participate in various sub-committees of the program – Leaders Group, Technical Advisory Committee, Education and Outreach.*
- *Reclamation was involved in the development and review of solicitation packages from potential contractors to conduct a salt and nitrate pilot study.*
- *Reclamation provided an update to the technical advisory committee regarding MAA and RTMP activities*

**D. Central Valley Project Deliveries Load Calculation**

Description: The Central Valley Project (CVP) delivers water to both the Grassland and Northwest subareas (as described in the Basin Plan) through the Delta-Mendota Canal (DMC). The DMC starts at the pumping headworks in the Delta, the C.W. Jones (Jones) Pumping Plant at Tracy, California. Water is conveyed south to the San Luis Reservoir, where water is mixed with the State Water Project in O'Neill Forebay and then either pumped into San Luis Reservoir for later delivery, or conveyed further south through the DMC to the Mendota Pool. Turnouts and groundwater pump-ins occur at several locations along the DMC. "Reach 1" of the DMC includes turnouts between the Jones Pumping Plant and the San Luis Reservoir. Deliveries for Reach 1 are made through the San Luis Canal and the Cross Valley Canal, as well as directly out of the DMC. "Reach 2" of the DMC includes turnouts between the O'Neill Forebay and the Mendota Pool. "Reach 3" covers deliveries made out of the Mendota Pool. Some simplification of this system has been made for accounting purposes, as some districts take portions of their deliveries through several turnouts.

Quantification Methodology: The Basin Plan allocates a load to Reclamation for water delivered to the Grassland and Northwest side Subareas. This load allocation is calculated according to Table IV-8 Summary of Allocations and Credits:

$$LA_{DMC} = Q_{DMC} * 52 \text{ mg/L} * 0.0013599$$

Where:

$LA_{DMC}$  = Load Allocation of salts, in tons

$Q_{DMC}$  = monthly amount of water delivered to Grassland and Northwest side subareas, in acre feet

52 = "background" TDS of water in the San Joaquin River at Friant per the Basin Plan

0.0013599 = factor for converting units into tons

Anything above this load allocation is an excess salt load which must be offset. Reclamation is proposing to offset this excess salt load through the actions described in the Action Plan. Excess salt loads are calculated by the following equation:

$$EL_{DMC} = Q_{DMC} * (C_{DMC} - 52 \text{ mg/L}) * 0.0013599$$

Where:

$EL_{DMC}$  = excess salt load above the Load Allocation ( $LA_{DMC}$ ), in tons

## Quarterly Activity Report – 2<sup>nd</sup> Qtr 2009

- $Q_{DMC}$  = monthly amount of water delivered to Grassland and Northwest side subareas, in acre feet  
 $C_{DMC}$  = monthly average (arithmetic mean) of salinity of the water delivered to Grassland and Northwest Subareas, in mg/L  
 52 = “background” salinity of water in the San Joaquin River at Friant per Basin Plan  
 0.0013599 = factor for converting units into tons

Each delivery reach’s  $Q_{DMC}$  is calculated and then paired with the associated monthly average EC for that reach, so the equation essentially becomes:

$$EL_{DMC} = 0.0013599 * \Sigma(Q_{DMC} * (C_{DMC} - 52 \text{ mg/L}))_{\text{Reach 1-3}}$$

This equation is then broken into two calculations, one for each subarea. Table 4 summarizes data taken from the monthly report titled *Delta-Mendota Canal Water Quality Monitoring Program* and illustrates the excess loads from the subareas and the total excess loads from CVP deliveries.

Table 4

	Grassland						Northwest					Total
	San Joaquin River and Mendota Pool Deliveries from CVP, load in tons	Delta- Mendota Canal Deliveries from CVP, load in tons	San Luis and Cross Valley Canal Deliveries from CVP, load in tons	Total Flow, TAF	Background Allowance Load, tons	Excess Load, tons	San Joaquin River and Mendota Pool Deliveries from CVP, load in tons	Delta- Mendota Canal Deliveries from CVP, load in tons	Total Flow, TAF	Background Allowance Load, tons	Excess Load, tons	Total Excess Load from CVP Deliveries, tons
Apr-09	25,138	6,612	5,213	74,708	5,279	31,684	1,598	1,574	6,654	470	2,702	34,385
May-09	38,075	13,838	7,086	122,362	8,647	50,351	3,271	2,087	12,271	867	4,491	54,842
Jun-09	45,388	13,286	8,137	134,467	9,502	57,309	3,938	2,165	13,615	962	5,141	62,450
Qtr Total	108,601	33,736	20,435	331,537	23,429	139,344	8,807	5,826	32,541	2,300	12,333	151,677

### E. Reporting Requirements

In the MAA, Reclamation agreed to provide quarterly reports to the Regional Board. Reclamation will consult with the Regional Board before proposing any changes to the sample report format. Quarterly reports are due 45 days after the end of the calendar quarter:



End of calendar quarter	Due date of Quarterly report
Dec 31, 2008	Feb 15, 2009
March 31, 2009	May 15, 2009
June 30, 2009	August 15, 2009
September 30, 2009	November 15, 2010
December 31, 2009	February 15, 2010
March 31, 2010	May 15, 2010
June 30, 2010	August 15, 2010
September 30, 2010	November 15, 2010
December 31, 2010	February 15, 2011

#### **F. Funding Reporting**

Reclamation agreed in the MAA to seek additional funding, including grant funding, to support salinity control efforts. In its quarterly reports, Reclamation will report on its efforts to support the securing of additional funding.

#### **Activity:**

- *A funding request was submitted for the 2010 budget for WSRDP.*
- *A funding request was submitted for the 2011 budget for WSRDP.*
- *A funding request was submitted for the 2011 budget for administrative coordination and activities related to the RTMP.*
- *A funding request was submitted for the 2011 budget for the administration of the Grassland Bypass Project.*